INDICATOR TUBE

Cold cathode numerical indicator tube for top viewing. Formely Z550M

<table>
<thead>
<tr>
<th>QUICK REFERENCE DATA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Numeral height</td>
</tr>
<tr>
<td>Numerals</td>
</tr>
<tr>
<td>Supply voltage</td>
</tr>
<tr>
<td>Cathode current</td>
</tr>
<tr>
<td>Starter selecting voltage</td>
</tr>
</tbody>
</table>

DIMENSIONS AND CONNECTIONS

Base: B13B

Dimensions in mm

GENERAL

The 3 mm high numerals are displayed in radial form.
The tube is primarily intended for use in circuits with transistor control.

PRINCIPLE OF OPERATION

The pulsating d.c. supply voltage (preferably half sine waves) causes one of the ten pure molybdenum cathode positions to glow. This position will be determined by the voltage level of corresponding starter being a few volts above the level of the remaining starters.
ACCESSORIES

Socket

2422 505 00001 or 2422 505 00002

MOUNTING POSITION

Any

The numerals are viewed through the dome of the envelope.
The numerals appear upright when the tube is mounted with the line through pins 1 and 8, vertical pin 1 being uppermost.
Number 0 is aligned with pin 1 to within 3°.

CHARACTERISTICS AND OPERATING CONDITIONS

Recommended circuit

Transformer secondary voltage

Cathode resistor

Starter series resistor

Shunting capacitor

Starter selecting voltage

V_{st-st}  

V_{tr}  110 \text{ V} \pm 10\% \text{ }^1)

R_{k}  10 \text{ k}\Omega \pm 5\%

R_{st}  330 \text{ k}\Omega \text{ }^2)

C_{k}  33 \text{ nF} \text{ }^1)

See sheet 4 upper figure and \text{ }^2) on page 3

Starter current

Maintaining voltage

Recommended cathode current

I_{st}  50 \text{ } \mu\text{A}

V_{m}  84 \text{ V}

I_{k}  3 \text{ mA}

\text{ }^1) \text{ The rectified a.c. voltage should be free from spikes.}
A shunting capacitor C_k of 33 \text{ nF} serves this purpose.

\text{ }^2) \text{ This resistor should be mounted close to the tube socket.}
LIFE EXPECTANCY at recommended operating conditions and room temperature

Continuous display of one digit 1) 1000 h
Sequentially changing the display from one
digit to the others every 100 h or less  min. 20 000 h

The criterium for the end of life point is given by the minimum value of starter selecting voltage $V_{st-st}$ shown on sheet 4 upper figure.

LIMITING VALUES (Absolute max. rating system)

A.C. supply voltage

<table>
<thead>
<tr>
<th>Voltage</th>
<th>min.</th>
<th>max.</th>
</tr>
</thead>
<tbody>
<tr>
<td>$V_{tr}$</td>
<td>90 Vrms</td>
<td>150 Vrms</td>
</tr>
</tbody>
</table>

See also sheet 4 lower figure

Frequency of mains supply

<table>
<thead>
<tr>
<th>Frequency</th>
<th>min. to max.</th>
</tr>
</thead>
<tbody>
<tr>
<td>$f$</td>
<td>40 to 100 Hz</td>
</tr>
</tbody>
</table>

Cathode current (average)

<table>
<thead>
<tr>
<th>Current</th>
<th>min.</th>
<th>max.</th>
</tr>
</thead>
<tbody>
<tr>
<td>$I_k$</td>
<td>2 mA</td>
<td>4 mA</td>
</tr>
</tbody>
</table>

Starter selecting voltage

<table>
<thead>
<tr>
<th>Voltage</th>
<th>min.</th>
<th>max.</th>
</tr>
</thead>
<tbody>
<tr>
<td>$V_{st-st}$</td>
<td>30 V</td>
<td></td>
</tr>
</tbody>
</table>

The common starter bias potential may deviate by a maximum of $\pm$ 5 V from the anode potential.

1) Under conditions of longer continuous display on one digit it is recommended to apply a starter selecting voltage $V_{st-st}$ greater than the minimum value, as indicated on sheet 4 upper figure.

2) The common starter bias potential may deviate by a maximum of $\pm$ 5 V from the anode potential.
Voltage sensitivity curve (valid over life)
The line M-M' represents the minimum necessary value of starter selecting voltage V_st-st

area of transfer

average

area of no transfer

V_tr (V_{RMS}, 50Hz)

V_{st-a} (V)

R_k (A)

area of permissible operation

I_k = 2mA

I_k = 3mA

I_k = 4mA